

REMARKS

I. INTRODUCTION

Claims 1, 15 and 29 have been amended above to broaden the scope thereof, support being found in the originally filed specification and drawings. New claims 55-60 have been added to include the subject matter removed from amended independent claims 1, 15 and 29 and/or to recite certain subject matter which Applicant believes includes novel features. Claims 1-9, 11-23, 25-37, 39-48 and 52-60 are currently under consideration in the above-referenced application. Provided above, please find a claim listing indicating the amendments to claims 1, 15 and 29, and additions of claims 55-60 on separate sheets so as to comply with the requirements set forth in 37 C.F.R. § 1.121. It is respectfully submitted that no new matter has been added.

II. REJECTIONS UNDER 35 U.S.C. 103(a) SHOULD BE WITHDRAWN

Claims 1, 3, 6-9, 11-13, 15, 17, 20-23, 25-27, 29, 31, 34-37, 39-41, 43-48 and 52-54 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,016,047 issued to Notten et al. (the "Notten Patent"), in view of U.S. Patent No. 5,049,804 issued to Hutchings (the "Hutchings Patent"). Claims 2, 4, 14, 16, 18, 28, 30, 32 and 42 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Notten Patent and the Hutchings Patent, further in view of U.S. Patent No. 5,767,659 issued to Farley (the "Farley Patent"). Claims 5, 19 and 33 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Notten Patent, the Hutchings Patent and the Farley Patent, further in view of U.S. Patent No. 5,889,385 issued to Podrazhansky et al. (the "Podrazhansky Patent"). Claims 14, 28 and 42 stand rejected under 35 U.S.C. § 103(a) as allegedly being also unpatentable over the Notten Patent and

the Hutchings Patent, further in view of U.S. Patent No. 6,188,202 issued to Yagi (the “Yagi Patent”). Applicant respectfully submits that the alleged combination of the Notten Patent and the Hutchings Patent, taken alone or in combination with the Farley Patent, the Podrazhansky Patent and/or the Yagi Patent, fails to teach, suggest or disclose the subject matter recited in amended independent claims 1, 15 and 29, and the claims which depend therefrom. Thus, it is respectfully requested that the 35 U.S.C. § 103(a) rejections of these claims be withdrawn for at least the reasons set forth herein below.

“The disclosure in an assertedly anticipating reference must be adequate to enable possession of the desired subject matter. It is insufficient to name or describe the desired subject matter, if it cannot be produced without undue experimentation.” *Elan Pharms., Inc. v. Mayo Found.*, 346 F.3d 1051, 1055 (Fed.Cir.2003). “To serve as an anticipating reference, the reference must enable that which it is asserted to anticipate.” *Id.* at 1054. “Enablement requires that ‘the prior art reference must teach one of ordinary skill in the art to make or carry out the claimed invention without undue experimentation.’” *Id.* (quoting *Minnesota Mining and Manufacturing Co. v. Chemque, Inc.*, 303 F.3d 1294, 1301, 64 USPQ2d 1270, 1278 (Fed.Cir.2002). “When considering whether or not a prior art reference requires ‘undue experimentation’ we look at the reference from the perspective of a person of ordinary skill in the art.” *Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 457 F.3d 1293,1306-07 (Fed.Cir.2006); referencing *In re Wands*, 858 F.2d 731, 735 (Fed.Cir.1988).

Factors to be considered in determining whether a disclosure would require undue experimentation . . . include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

In re Wands, 858 F.2d 731, 737 (Fed.Cir.1988). “As explained in *Enzo Biochem*, 188 F.3d at 1372, ‘an enablement determination is made retrospectively, *i.e.*, by looking back to the filing date of the patent application and determining whether undue experimentation would have been required to make and use the claimed invention at that time.’” 346 F.3d 1051 at 1056-57 (quoting *Enzo Biochem, Inc. v. Calgene, Inc.*, 188 F.3d 1362, 1372 (Fed.Cir.1999.)

“To reject claims in an application under Section 103, an examiner must show an unrebutted *prima facie* case of obviousness.” *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998). The Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), stated:

Under Section 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

Indeed, to sustain a rejection under 35 U.S.C. § 103(a), there must be some teaching, other than the instant application, to alter the prior art to arrive at the claimed invention. “The problem confronted by the inventor must be considered in determining whether it would have been obvious to combine the references in order to solve the problem.” *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 679 (Fed. Cir. 1998).

The objective standard for determining obviousness under 35 U.S.C. § 103, as set forth in *Graham v. John Deere, Co.*, 383 U.S. 1 (1966), requires a factual determination to ascertain: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; and (3) the differences between the claimed subject matter and the prior art. Based on these factual inquiries, it must then be determined, as a matter of law,

whether or not the claimed subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the alleged invention was made. *Graham*, 383 U.S. at 17. Courts have held that there must be some suggestion, motivation or teaching of the desirability of making the combination claimed by the applicant (the “TSM test”). See *In re Beattie*, 974 F.2d 1309, 1311-12 (Fed. Cir. 1992). This suggestion or motivation may be derived from the prior art itself, including references or disclosures that are known to be of special interest or importance in the field, or from the nature of the problem to be solved. *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996).

Although the Supreme Court criticized the Federal Circuit’s application of the TSM test, see *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, (2007) the Court also indicated that the TSM test is not inconsistent with the *Graham* analysis recited in the *Graham v. John Deere* decision. *Id.*; see *In re Translogic Technology, Inc.*, No. 2006-1192, 2007 U.S. App. LEXIS 23969, *21 (October 12, 2007). Further, the Court underscored that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR*, 127 S. Ct. at 1741. Under the precedent established in *KSR*, however, the presence or absence of a teaching, suggestion, or motivation to make the claimed invention is merely one factor that may be weighed during the obviousness determination. *Id.* Accordingly, the TSM test should be applied from the perspective of a person of ordinary skill in the art and not the patentee, but that person is creative and not an automaton, constrained by a rigid framework. *Id.* at 1742. However, “the reference[s] must be viewed without the benefit of hindsight afforded to the disclosure.” *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994).

The prior art cited in an obviousness determination should create a reasonable expectation, but not an absolute prediction, of success in producing the claimed invention. *In re O'Farrell*, 853 F.2d 894, 903-04 (Fed. Cir. 1988). Both the suggestion and the expectation of success must be in the prior art, not in applicant's disclosure. *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 927 F.2d 1200, 1207 (Fed. Cir. 1991) (citing *In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988)). Further, the implicit and inherent teachings of a prior art reference may be considered under a Section 103 analysis. See *In re Napier*, 55 F.3d 610, 613 (Fed. Cir. 1995).

Secondary considerations such as commercial success, long-felt but unsolved needs, failure of others, and unexpected results, if present, can also be considered. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538-39 (Fed. Cir. 1983). Although these factors can be considered, they do not control the obviousness conclusion. *Newell Cos. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988).

To establish obviousness, the prior art references must be evaluated as a whole for what they fairly teach and neither the references' general nor specific teachings may be ignored. *Application of Lundsford*, 357 F.2d 385, 389-90 (CCPA 1966). A reference must be considered for all that it teaches, not just what purportedly points toward the invention but also that which teaches away from the invention. *Ashland Oil, Inc. v. Delta Resins & Refractories*, 776 F.2d 281, 296 (Fed. Cir. 1985).

The Notten Patent relates to a battery management system which includes input means for receiving input signals representative of a physical quantity of a battery and processing means for calculating at least one physical quantity of the battery at least

partially based on the input signals and a battery temperature; and for generating an output signal derived from the calculated physical quantity. The Notten Patent also describes a battery charger/discharger including a battery management system. (See Notten Patent, Abstract). The Notten Patent broadly describes that the battery management system 100 of Fig. 2 controls the battery charger 200 by maintaining the battery temperature substantially at a predetermined temperature curve. In a simple form, the battery temperature is maintained at a constant temperature of, for instance, 30°C. Alternatively, the battery temperature is maintained at a predetermined offset, for instance 10°C., related to the ambient temperature. (See *id.*, col. 26, Ins. 6-17).

The described simulation tool of the Notten Patent can allegedly be used to design an optimum temperature curve for a specific application and operating environment. It will be appreciated that any conventional control loop may be used to control the battery charger 200 in such a way that the battery temperature substantially matches the predetermined temperature curve. The current or voltage level supplied by the battery charger 200 may be controlled by the control loop. Alternatively, the battery charger 200 may use a pulsed-voltage or pulsed-current charging scheme, where the control loop controls, for instance, the pulse duration and/or pulse shape. Obviously also suitable combinations of the charging schemes may be used. The battery management system 100 uses the calculated battery temperature for accurately controlling the battery charger 200. The battery management system 100 may use a measured battery temperature to control the battery charger 200. (See *id.*, col. 26, Ins. 18-35).

The Notten Patent further states that its Fig. 8a shows that the battery voltage increases at higher charging currents due to the higher potential drop. (See *id.*, col. 26, Ins. 65-67; and Fig. 8a). The temperature development during charging is allegedly shown in Fig. 10a of the Notten Patent. The temperature becomes higher at higher currents. According to the Notten Patent, the strongest temperature rise occurs when the pressure starts to level off. This is due to the large heat contribution of the oxygen recombination reaction, which occurs at an overpotential of 1.2 V. (See *id.*, col. 27, Ins. 30-35; and Fig. 10a).

The Hutchings Patent “relates to devices for charging or recharging electric batteries and particularly a universal battery recharger for batteries having different charging characteristics.” (Hutchings Patent, col. 1, Ins. 12-15).

The Farley Patent relates to a battery pack including a component in which predetermined battery parameters definitive of a battery pack characteristic may be stored, together with a battery parameter sensor. (See *id.*, Abstract). The arrangement of the Farley Patent uses a processor that monitors cell temperature with time. For example, temperature measurements are logged at intervals such as each 5-10 seconds, and when a profile which matches a stored profile indicative of substantially full charge is identified, the transistor may be switched to shunt the charging current. The battery pack temperature may then rise due to the heat dissipated in a resistor R enabling the simple full charge detection by temperature of the battery charger to operate to end or shut-off the fast charge current in appropriate charger types. The processor of the Farley Patent may be arranged

such that this overcharge protection occurs only when the temperature rise is due to the charging current (i.e. flow into the cells). (See *id.*, col. 5, Ins. 35-51, and col. 19, Ins. 50-60).

As shown in Fig. 8b of the Farley Patent, the cell temperature is read and stored so that a profile of cell temperature with time may be built up. If the cell temperature is within the range (step 89) for which fast charging is appropriate, then the cell temperature profile established to date is examined to see if the profile is equivalent to that of a full charged cell array (step 800). If not, after a pause of 1 minute and assuming the timer which has set the fast charging time limit before current shunting is to be applied has not expired (801), control loops back to a point label (a) where a portion of the aforesaid control regime is repeated. An outcome of this iteration is that repeated samples of cell temperature with time are stored and a profile built up which will eventually equate with the full charge profile (at step 800). An adjustment to the assumed charge state (i.e., 90% charged which is also known as profile) may be made to account for temperature. Whether full charge was reached or not, the current charge level, based on the charging which has occurred applied to the previously stored battery charge status, is displayed. At this point when the battery is fully charged (at step 805), the current shunting transistor is switched on so that only a trickle current remains at the cell terminals. (See *id.*, col. 10, Ins. 1-27; and Fig. 8b).

Amended independent claim 1 recites a battery charger configured to provide a temperature-regulated charging of a battery, comprising, *inter alia*:

a processing arrangement operable to:

- (a) obtain a temperature data associated with the battery; and

- (b) **apply a particular amount of a charge to the battery based on the temperature data of the battery, wherein the processing arrangement is configured to maintain the battery at a predetermined threshold temperature during at least a majority of an entire time period in which the charge is applied to the battery.**

Amended independent claims 15 and 29 relate to a related process and a storage medium, respectively, and recite similar subject matter, i.e., *inter alia*, **apply[ing] a particular amount of a charge to the battery based on the temperature data of the battery, wherein the processing arrangement is configured to maintain the battery at a predetermined threshold temperature during at least a majority of an entire time period in which the charge is applied to the battery.**

It is respectfully asserted that the alleged combination of the Notten Patent and the Hutchings Patent at least fail to provide an enabling teaching or suggestion of a battery charger configured to provide a temperature-regulated charging of a battery, or a related process or storage medium, comprising a processing arrangement operable to **apply[ing] a particular amount of a charge to the battery based on the temperature data of the battery, wherein the processing arrangement is configured to maintain the battery at a predetermined threshold temperature during at least a majority of an entire time period in which the charge is applied to the battery** as recited in amended independent claims 1, 15 and 29 of the above referenced application, respectively, so as to enable one skilled in the art at the time of invention to have made and used the invention.

In the present Office Action, the Examiner points to the Notten Patent, col. 8, Ins. 5-35, as allegedly describing the above-referenced claimed features. (See Office Action dated January 6, 2009, p. 2.) However, the vague description provided in col. 8, Ins.

5-35 of the Notten Patent would not have enabled one having ordinary skill in the art at the time the above-identified application was filed to make and use the present invention, especially the recited feature of **apply[ing] a particular amount of a charge to the battery based on the temperature data of the battery, wherein the processing arrangement is configured to maintain the battery at a predetermined threshold temperature during at least a majority of an entire time period in which the charge is applied to the battery** as provided in amended independent claims 1, 15 and 29 of the above referenced application. This is at least because the Notten Patent does not teach or suggest **how** to achieve such control of the battery charge.

Rather, col. 26, Ins. 5-35 of the Notten Patent only generally discusses a temperature-controlled battery charging concept. For example, the Notten Patent contends that “the battery management system 100 of FIG. 2 controls the battery charger 200 by maintaining the battery temperature substantially at a predetermined temperature curve. In a simple form, the battery temperature is maintained at a constant temperature of, for instance, 30° C. Alternatively, the battery temperature is maintained at a predetermined offset, for instance 10° C, related to the ambient temperature.” (Notten Patent, col. 26, Ins. 9-15). This vague example of the Notten Patent asserts that “the current or voltage level supplied by the battery charger 200 may be controlled by the control loop [and that a]lternatively, the battery charger 200 may use a pulsed-voltage or pulsed-current charging scheme, where the control loop controls, for instance, the pulse duration and/or pulse shape.” (*Id.*, Ins. 24-29). The Notten Patent further purports that “the battery management system 100 uses the calculated battery temperature for accurately controlling the battery

charger 200 [and that] the battery management system 100 may use a measured battery temperature to control the battery charger 200.” (Id., Ins. 31-35).

However, again, the Notten Patent does not teach or suggest **how** to achieve such control of the battery charge. For example, the section of the Notten Patent relied on by the Examiner does not teach or suggest **how** the current or voltage level supplied by the battery charger 200 may be controlled by the control loop. Indeed, no specific information as to **how** the battery charger 200 may be controlled by the control loop is provided at all in the Notten Patent. While smart battery chargers typically use some form of a control loop (e.g., read sensors, determine changes, repeat), the specifics of which may vary greatly. One having ordinary skill the art at the time the above-identified application was filed would not have been able to implement a control loop to make and use the present invention based on the brief discussion of the Notten Patent relied on by the Examiner.

Further, the Notten Patent does not teach or suggest **how** battery charger 200 may use a pulsed-voltage or pulsed-current charging scheme, where the control loop controls, for instance, the pulse duration and/or pulse shape. Similarly, the section of the Notten Patent relied on by the Examiner does not explain **how** the charge may be changed, but only that it is changed.

For example, the section of the Notten Patent relied on by the Examiner does not even address whether to change the voltage *up* or *down*, or *by how much* or *for how long*. Indeed, no specific information at all regarding how the battery may be charged, including even ranges, and moreover, control of the charge to maintain the battery at a predetermined threshold temperature during at least a majority of an entire time period in

which the charge is applied to the battery (as recited in amended independent claims 1, 15 and 29) is provided in the Notten Patent.

Thus, one having ordinary skill in the art at the time the above-identified application was filed would not have been able to make and use the invention recited in amended independent claims 1, 15 and 29 based on the disclosure of the Notten Patent at all, and certainly not without undue experimentation. Indeed, the inventor of the present application has thereby confirmed the same via a declaration under 37 C.F.R. § 1.132. (See, e.g., Declaration of Chris Harrison Pursuant to § 1.132, submitted herewith – the “Harrison Declaration”).

The Hutchings Patent does not cure at least such deficiencies and the Examiner does not contend that it does.

Accordingly, for at least the reasons described above, Applicant respectfully asserts that the alleged combination of the Notten Patent and the Hutchings Patent does not provide an enabling teaching or suggestion of **apply[ing] a particular amount of a charge to the battery based on the temperature data of the battery, wherein the processing arrangement is configured to maintain the battery at a predetermined threshold temperature during at least a majority of an entire time period in which the charge is applied to the battery** as recited in amended independent claims 1, 15 and 29 of the above referenced application. The Farley Patent, the Podrazhansky Patent and the Yagi Patent do not cure at least these deficiencies of the Notten Patent, and the Examiner does not contend that they do.

Therefore, Applicant respectfully submits that the alleged combination of the Notten Patent and the Hutchings Patent, even if combined with the Farley Patent, the Podrazhansky Patent or the Yagi Patent, fails to teach or suggest the subject matter recited in amended independent claims 1, 15 and 29. The claims which depend from these amended independent claims are also believed to be allowable over the Notten, Hutchings, Farley, Podrazhansky and Yagi Patents for at least the same reasons as set forth herein above with respect to amended independent claims 1, 15 and 29.

Thus, for at least these reasons, the 35 U.S.C. § 103(a) rejection of amended independent claims 1, 15 and 29, and the § 103(a) rejections of the claims which depend therefrom, should be withdrawn. In addition, it is believed that the claims which depend from amended independent claims 1, 15 and 29 are also allowable over the alleged combination of the Notten, Hutchings, Farley, Podrazhansky and Yagi Patents for at least the same reasons, as well as contain separate patentably distinct subject matter.

III. NEW CLAIMS

New claims 55-57, which depend from amended independent claims 1, 15 and 28, respectively, have been added above to include the subject matter removed from amended independent claims 1, 15 and 29. New claims 58-60, which depend from claims 14, 28 and 42, respectively, have been added above to recite certain subject matter which Applicant believes includes novel features. Support for these new claims can be found in the originally-filed specification, drawings and claims.

In particular, new claims 55-57 recite, *inter alia*, “wherein, at least when the charge is initially applied to the battery, the particular amount of the charge is 10A or

greater.” New claims 58-60 recite, *inter alia*, “wherein the cooling arrangement includes at least one of a fan or a water-circulation system operable based on at least one of real-time data, historical data or other data utilized to compute an appropriate charging value of the charge.”

For at least the reasons discussed above with respect to amended independent claims 1, 15 and 29, Applicant respectfully asserts that new claims 55-60 are also allowable over the alleged combination of the Notten, Hutchings, Farley, Podrazhansky and Yagi Patents, and contain separate patentably distinct subject matter.

IV. CONCLUSION

In light of the foregoing, Applicant respectfully submits that all pending claims 1-9, 11-23, 25-37, 39-48 and 52-60 are in condition for allowance. Prompt consideration, reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

Date: April 6, 2009

By: 

Gary Abelev
Patent Office Reg. No. 40,479

Randall M. Berman
Patent Office Reg. No. 61,609

DORSEY & WHITNEY, L.L.P.
250 Park Avenue
New York, New York 10177

Attorney(s) for Applicant(s)
(212) 415-9371